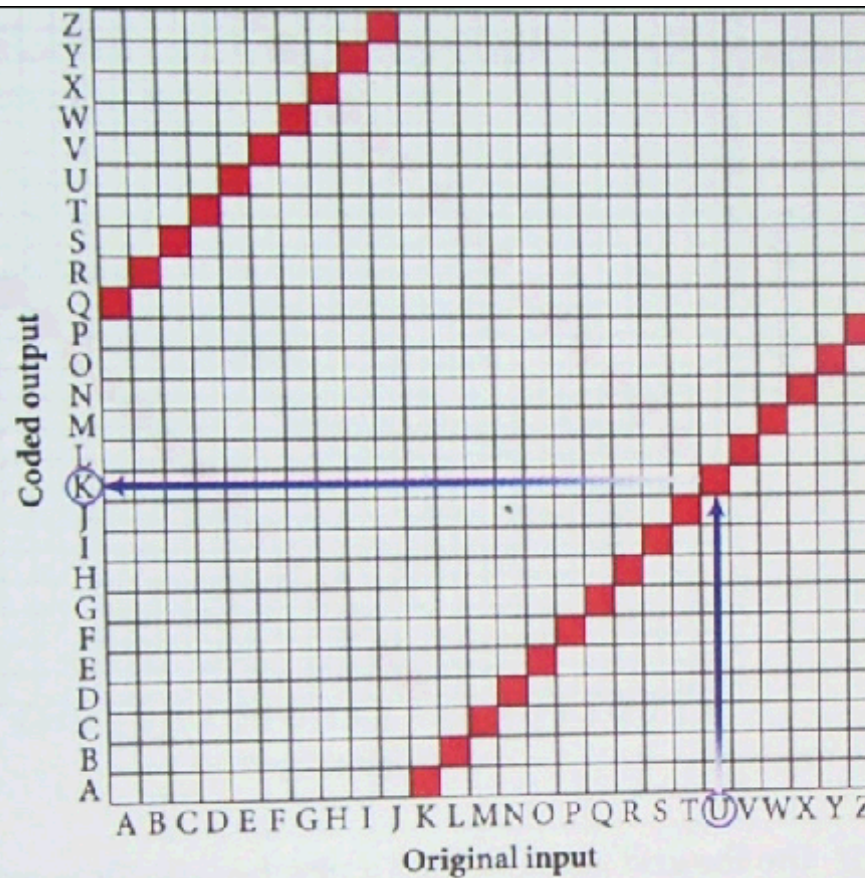


Original input	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Coded output	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P

Decode the message below. Don't tell your neighbors what it says. After you finish doing what it says to do, give me the result.

THQM Q FEETBU

+



for A → J

Position + 16 = code position

A → Q

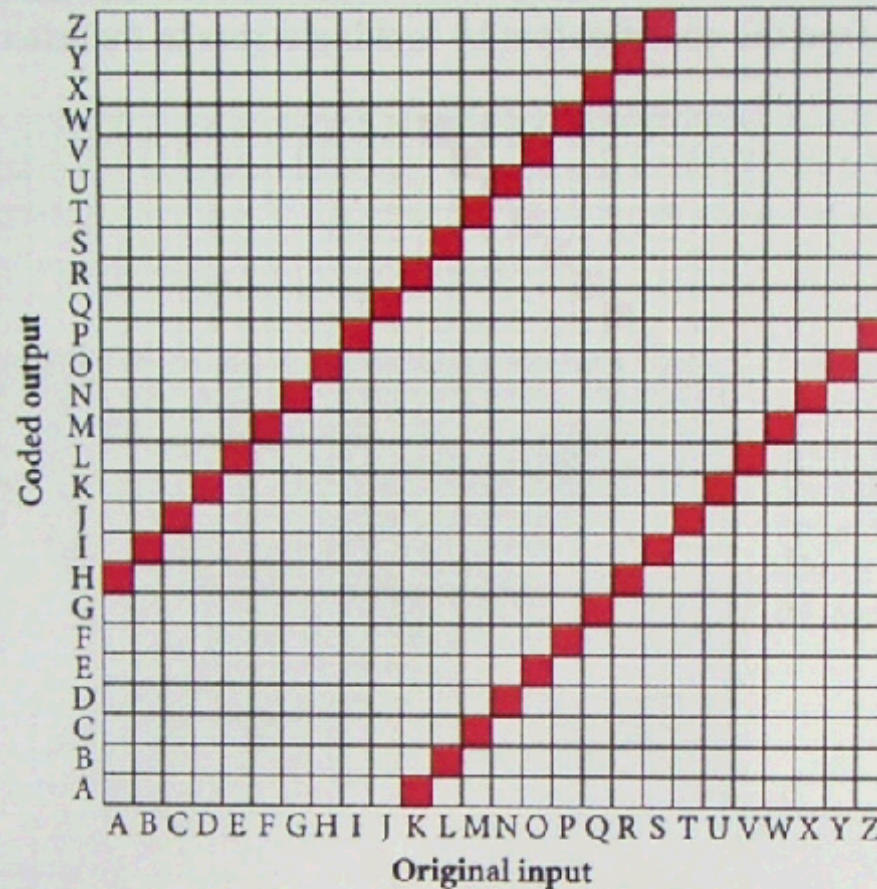
 $1 + 16 = 17$

for K-Z

subtract 10

- 1 Use the coding grid to write a two-word or three-word message.
- 2 Think of the letters A through Z as the numbers 1 through 26. Write two different rules to describe this code. Write one rule that adds a constant number to a letter's position in the alphabet. Write a second rule that subtracts a constant number from the letter's position. Explain how to code letters that are shifted to a position which is less than 1 or greater than 26.
- 3 Exchange your coded message with a partner. Use this grid or one of your rules to decode each other's messages.

Here is another new code.



+

- Step 8 Use the grid above to send a new two- or three-word message to your partner. Exchange and decode each other's messages.
- Step 9 Did your partner successfully decode your message? Why or why not?
- Step 10 How is the new grid in Step 8 different from the grid in Step 1? Code the word FUNCTION to help you answer this question.
- Step 11 Which grid makes it easier to decode messages? Which coded output letters are difficult to decode into their original input letters?

Tell whether or not each table of values represents a function. Give the domain and range of each relationship.

Table A

Input	Output
1	2
2	4
3	6

Func.

Table B

Input	1	0	1
Output	1	2	5

not

Table C

Input	1	2	3	4	5	6
Output	0	0	0	0	0	0

To be a function, each input must have exactly one output. It is helpful to use arrows to show which input value matches which output value.

Table A

Each input value matches one output value. So this relationship is a function. The domain is $\{1, 2, 3\}$, and the range is $\{2, 4, 6\}$.

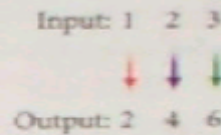


Table B

The input value 1 has two outputs, 1 and 5. This relationship is not a function because there is an input value with more than one output value. The domain is $\{0, 1\}$, and the range is $\{1, 2, 5\}$.

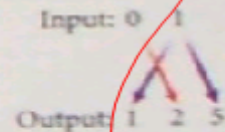
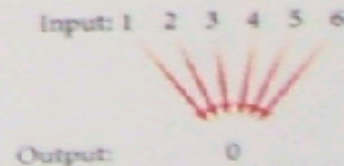


Table C

Each input value matches exactly one output value. So this relationship is a function, even though all the inputs have the same output. The domain is $\{1, 2, 3, 4, 5, 6\}$, and the range is $\{0\}$.



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Functions
every input has
only one output

sect. 8.1

#1-4, 6